A New Accounting Approach to Evaluate M&A Prices and Goodwill Allocations

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ABSTRACT

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This dissertation introduces a new method for evaluating mergers and acquisitions (M&As) and goodwill allocations associated with them. This method differs from Generally Accepted Accounting Principles (GAAP), which estimate the sum of the fair value of net identifiable assets by focusing on balance sheet information, and recognizes the remainder of the purchase price as goodwill. The new method utilizes both balance sheet and income statement information to estimate the value of a target as a business, and treats the remainder of the purchase price as the uncertain growth expectation. Using the new approach, I document that uncertain growth expectations in M&A prices (1) are negatively related to acquirer's long-term returns, (2) predict future goodwill impairments, and (3) are superior to event-date market reactions and premiums as a predictor of acquirers' future performance.

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DEDICATION

To my parents, San Keon Oh and Myung Sook Chung, and my wife, Sou Hyun Jang

Section 1: Introduction

Identifying what acquirers are paying for their targets is important in evaluating merger and acquisition (M&A) deals. A portion of the purchase price is paid for identifiable tangible assets and other portions for uncertain growth expectations like synergy effects. Current Generally Accepted Accounting Principles (GAAP) focuses on balance sheet information to identify the value of a target. Acquirers are required to recognize the book value of targets, estimate the fair value of net identifiable assets, and allocate the remainder to goodwill (a plugged number). However, the value of a target as a business is not the sum of net identifiable assets. It is rather the combination of book value of assets (balance sheet numbers) and earnings-creating ability realized from the joint use of assets (income statement numbers).

This study introduces a new way to evaluate M&A deals that utilize information from both the balance sheet and income statement to value a target as a business. I decompose purchase price into three components: book value, the value from predictable short-term earnings, and the remainder. Book value is recorded with historical cost accounting on a target's balance sheet. The value from predictable short-term earnings is based on a target's predictable income statement. The value from predictable short-term earnings, unlike the sum of the fair value of net identifiable assets, represents the earnings-creating ability of a target as a business. Lastly, I show the part of purchase price not based on a target's accounting information to have a specific interpretation, namely, the uncertain growth expectations (or expected synergy effects) associated with an M&A deal.

This interpretation addresses the questions of whether uncertain growth expectations (1) predict acquirers' future returns, (2) challenge the allocation to goodwill under GAAP accounting,

and (3) better answer prior questions than measures commonly used in earlier studies, such as market reactions to deal announcement dates and premiums.

The first question is important to both inside and outside investors of acquiring firms evaluating purchase prices. Separating overpaid M&A deals that result in negative future returns from successful M&A deals is critical. Using a sample of 215 mergers and acquisitions announced between 2001 and 2009, I find the value of uncertain growth expectations in purchase prices is negatively and significantly associated with acquirers' long-term returns, even after controlling for well-known risk factor loadings. These findings suggest that investors do not fully and immediately understand the implications of uncertain growth expectations in purchase prices for the long-term performance of acquiring firms.

The second question is related to prior studies of managers' opportunistic behavior with respect to current goodwill accounting (Watts 2003; Ramanna and Watts 2012) including a study that shows managers with earnings-based compensation plans to be more likely to over-allocate to goodwill (Shalev et al. 2013), a signal of the likelihood of a future impairment, which is another concern for investors. How investors disentangle goodwill to evaluate the possibility of future impairments is not revealed in the literature. The uncertain growth expectations in purchase prices, which I find to be positively related to future goodwill impairments but not to other parts of goodwill, can thus be interpreted as the signal of goodwill impairment.

The third question highlights the usefulness of uncertain growth expectations. Prior studies use market reactions on deal announcement dates to measure synergy effects (Henning et al. 2000; Martin and Shalev 2009; Francis and Martin 2010) and show premiums based on the market value of targets to be related to acquirers' future returns (Sirower1997) and future

goodwill impairments (Hayn and Hughes 2006; Li et al. 2011). These measures are based on two assumptions, (1) that market prices immediately and completely react to the implications of deal announcements, and (2) that basis prices (of targets) for premiums are not influenced by information leakage. The new measure introduced in this study is not subject to these assumptions. Indeed, uncertain growth expectations perform better than market reactions on deal announcement dates and premiums in predicting acquirers' future returns and future goodwill impairments.

This study contributes to the literature in several ways. First, to my knowledge, it is the first study that systematically utilizes both balance sheet and income statement information to evaluate M&A prices. Current accounting of business combinations is based on unverifiable balance sheet estimates (fair value of net identifiable assets). The present study uses predictable short-term earnings to evaluate M&A prices. Second, the study's major finding, that uncertain growth expectations of purchase prices predict acquirers' future performance, is based only on publicly available information (e.g., targets' form 10-Ks and analysts' forecasts). Thus, the main finding is useful not only to researchers, but also to practitioners including acquirers' outside investors. Third, the study introduces a benchmark for identifying the components of goodwill most likely to be impaired in the future. Many prior studies relate managers' opportunistic behavior to discretion in current goodwill accounting, but the literature doesn't provide a reliable tool for identifying which components of goodwill are related to future impairments. The benchmark introduced in this study provides researchers and practitioners alike with a useful tool for evaluating the risk of future goodwill impairments.

The rest of the paper is organized as follows. Section 2 discusses motivation and develops testable hypotheses. Section 3 explains the empirical research designs, Section 4 the variable estimations and sample selection process. Section 5 reports empirical findings and robustness checks. Section 6 concludes.

Section 2: Motivation and Hypothesis Development

2.1 Related literature

This paper is related to studies that examine post merger and acquisition (M&A) performance (Franks et al. 1991; Agrawal et al. 1992; Healy et al. 1992; Loughran and Vijh 1997; Rau and Vermaelen 1998) and to research that investigates managers' opportunistic behavior in M&A transactions (Jensen 1986; Harford 2005; Datta et al. 2001; Oler 2008). Some studies show premium amount to be related to future returns (Sirower 1997) and future goodwill impairments (Hayn and Hughes 2006; Li et al. 2011). I further demonstrate the unique contribution of the new measure by also using future returns and goodwill impairments to evaluate M&A performance.

It is important to estimate the right values of targets and acquirers in M&A deals, many prior studies having shown mis-valuation to be related to disappointing M&A performance (Rhodes-Kropf et al. 2005; Moeller et al. 2005; Dong et al. 2006; Bouwman et al. 2009; Gu and Lev 2011). Other studies, on the other hand, show the residual-earnings model to be useful for predicting future stock returns (e.g., Frankel and Lee 1998; Ali et al. 2003; Penman 2011). Valuation techniques based on the residual-earnings model provide a framework for

decomposing market prices into reliable parts and speculative expectations. Sirower and O'Byrne (1998) utilize the residual earnings model to recognize the value of a target and provide the post-M&A performance benchmark needed to make the deal a positive net-present-value (NPV) project. This study applies the residual earnings model framework to breaking and evaluating M&A prices.

The Statement of Financial Accounting Standards (SFAS) 141 introduced fair value estimates of net identifiable assets, and SFAS 142 removed goodwill amortizations. Some studies find the information disclosed under SFAS 141 and 142 to be useful to investors (Kimbrough 2007 a, b). Others have studied managers' exploitation of discretion in goodwill accounting (Watts 2003; Beatty and Weber 2006; Ramanna 2008; Shalev 2009). Francis and Martin (2010) and Kravet et al. (2012) investigate the relationship between accounting conservatism and mergers and acquisitions, some studies show goodwill impairment charges not to be recognized in a timely manner (Hayn and Hughes 2006; Li and Sloan 2011; Lys et al. 2012; Ramanna and Watts 2012)[1], and Shalev et al. (2013) document companies to allocate more to goodwill when CEO bonus is based on earnings. But none of the many studies that examine the problem of discretion in goodwill accounting provide any benchmark bases on financial statements that can be used to identify the amount of goodwill at risk of future impairment. A benchmark for unverifiable reported goodwill is nevertheless fundamental to a better understanding of managers' opportunistic behavior, and the present study fills this gap by introducing a benchmark that relies exclusively on publicly available information.

[1] See Ak et al. (2013) for a review of studies with goodwill impairment prediction models.

2.2 A new method of evaluating merger and acquisition (M&A) prices

I explain here how accounting valuation techniques from the residual earnings model can be applied to the evaluation of M&A prices. I then illustrate the implications for future acquirer performance and goodwill accounting of the purchase price components identified by valuation technique.

2.2.1 Valuation techniques

Penman (2011) points out the usefulness of accounting valuation techniques in general cases. "Accounting does not render the complete value but does tell us where our uncertainty about the market price lies and where we run the risk of paying too much.... [T]he uncertainty is about growth."[2] In other words, accounting valuation techniques enable investors to evaluate where uncertainties lie when purchasing a stock.

$$Market\ Value(MV) = Book\ Value_0(BV_0) + \frac{RE_1}{\rho} + \frac{RE_2}{\rho \cdot (\rho - g)}$$

where $RE_t(Residual\ Earnings_t) = Earnings_t - (1-\rho) \cdot BV_{t-1}$, g= *Growth Rate of RE,* and $\rho = Cost\ of\ Capital + 1$

[2] Penman (2011, p. 65)

The residual earnings model (Ohlson 1995; Penman 2012) is based on book value (*BV*), discounted short-term residual earnings ($\frac{RE_1}{\rho}$), capitalized short-term residual earnings ($\frac{RE_2}{\rho \cdot (\rho - g)}$), and expectations of residual earnings growth (g). The latter, being the growth rate implied by the market value, is termed an implied growth rate. Because the implied growth rate is based on what investors believe the growth rate of residual earnings will be, it is an uncertain expectation in the market value. Book value is based on observable balance sheets; discounted short-term and capitalized short-term residual earnings are based on predictable short-term earnings (e.g., analysts' forecasts). The implied growth rate, however, which is the expected residual earnings growth rate implied in the market value, is not based on current accounting numbers. Because the growth expectation in market value is measured by the implied growth rate of residual earnings, zero growth rate indicates the least uncertainty in a company's estimated value. Investors can thus separate market value into three components: book value, discounted and capitalized short-term expected residual earnings (at zero growth rate), and the remainder. I call capitalized short-term expected residual earnings the value from predictable short-term earnings (*VSE*) and the remainder of the market value the value from long-term growth (VSE_{MV}).

$$MarketValue(MV) = BookValue(BV) + Value\ from\ Short\ Term\ Earnings(VSE) + Value\ from\ LongTerm\ Growth_{MV}(VLG_{MV})$$

where $VSE = \frac{RE_1}{\rho} + \frac{RE_2}{\rho \cdot (\rho - g)}$ [3], and $VLG_{MV} = MV - (BV + VSE)$ is the value from long-term growth implied in the market value.

This method of market value decomposition uses both balance sheet and income statement information to calculate the value of a company as a business. Book value (*BV*) is from the balance sheet, the value from predictable short-term earnings (*VSE*) based on reliably predictable income statement numbers. Book value (*BV*) and value from predictable short-term earnings (*VSE*) are easily justifiable with accounting information, whereas value from long-term growth (VLG_{MV}) is not. Because the value from predictable short-term earnings (*VSE*) is estimated with no growth assumption in residual earnings, the value from long-term growth (VLG_{MV}) captures all uncertain growth expectations of market value. It is important that both balance sheet and income statement be incorporated in this valuation process. "Historical cost accounting leaves value off the balance sheet, but focuses on earnings which, we have seen, has an important role reducing the error from an accounting system. So there is no problem with omitted intangible assets, for example, if earnings from the assets are flowing through the income statement."[4]

2.2.2 Valuation techniques in purchase price evaluation

[3] Note that growth rate (*g*) is set to zero (no growth rate) here.
[4] Penman (2010, p.217)

Applied to M&A cases, Penman (2011)'s quote tells us where our uncertainty about the purchase price lies and where we run the risk of paying too much for the target. The uncertainty is about growth expectations in the target's residual earnings. I utilize the residual earnings model framework to evaluate the uncertainties embedded in merger and acquisition deals.

$$\begin{aligned} Purchase\ Price\ (PP) &= MV + Premium \\ &= BV + VSE + VLG_{MV} + Premium \\ &= BV + VSE + VLG_{PP} \end{aligned}$$

where $VLG_{PP} = VLG_{MV} + Premium$, VLG_{PP} is the value from long term growth implied in the purchase price, and *Premium* is the amount paid above the target's market value.

A company that acquires another company usually pays a premium over the target's market price. A premium paid over the market value, not being justifiable with the target's accounting, is added to the uncertain growth expectations of the purchase price (VLG_{PP}). Again, with the residual earnings model decomposition, investors can evaluate how much is invested on the value from predictable short-term earnings and how much on the value from long-term growth (or uncertain growth expectations). The value from long-term growth (VLG_{PP}) is the value that should be achieved as a combined entity (e.g. from synergy effects). In other words, the value from long-term growth (VLG_{PP}) is the uncertain growth expectation in an M&A deal, and is not based on the target's accounting numbers. Thus, the more an acquirer pays for the value from long-term growth (VLG_{PP}), the harder it is to make the investment profitable. I use

the value of long-term growth (VLG_{PP}) to predict acquirers' future performance (henceforth, *VLG* replaces VLG_{PP}).

2.2.3 Fair value adjustment and value from predictable short-term earnings

Current goodwill accounting has a unique feature: a target's identifiable assets should be evaluated at fair value and the difference between the purchase price and fair value of net identifiable assets be recognized as goodwill.

$$Purchase\ Price\left(PP\right) = BV + Fair\ Value\ Adjustment\left(FVadj\right) + GoodWill\left(GW\right)$$

This is a balance sheet approach to evaluating and allocating M&A purchase prices. Being the sum of fair value of net identifiable assets, the fair value adjustment does not include the earnings-creating ability of a target's assets used jointly in a business. For example, the value of Dell computer is not a simple sum of the fair value of the brand, inventories, and factories, but its ability to generate earnings by combining brand with innovative supply and distribution channels. Current goodwill accounting being focused more on the value of separable assets than on the value of a target as a business, reported goodwill is not economically interpretable because it is not the amount paid above the value of a target as a business.

The value from predictable short-term earnings, on the other hand, being capitalized future residual earnings with no growth ($VSE = \frac{RE_1}{\rho} + \frac{RE_2}{\rho \cdot (\rho - 1)}$), uses a target's balance sheet and income statement and captures its earnings-creating ability as well. Because the sum of book value and the value from predictable short-term earnings indicates the value of a target as a business, the remainder of the purchase price (the value from long-term growth) is economically interpretable as the amount paid in excess of a target's value, as captured by the uncertain growth expectation in the purchase price.

The uncertain growth expectation in the purchase price has an additional implication for goodwill accounting. It can provide a benchmark for evaluating goodwill. Current goodwill accounting is based on non-verifiable fair values of identifiable assets, as estimated by managers. All estimates being balance sheet based, this is a balance sheet approach. Moreover, since SFAS 142, that goodwill is not amortized and only tested for non-temporary impairments provides an incentive for managers who care about short-term earnings to understate the fair value of net identifiable assets, which results in goodwill being overstated (Shalev et al. 2013). The uncertain growth expectation achieves independence from managerial over-allocation incentives by utilizing both balance sheet and income statement numbers. I show uncertain growth expectations to be related to future goodwill impairments, in particular, that goodwill that cannot be accounted for by accounting information is more likely to be impaired.

Figure 1 compares the decomposition of purchase prices based on current GAAP accounting (left column) with the new method that uses both balance sheet and income statement information to estimate a target's value. The left column shows goodwill to be a plugged number after fair value of net identifiable assets is estimated. In the right column, the value from short-

term earnings (*VSE*) is the estimated value of a target based on predictable short-term earnings with a no-growth assumption ($VSE = \frac{RE_1}{\rho} + \frac{RE_2}{\rho \cdot (\rho - 1)}$). The dotted line between goodwill and value from long-term growth indicates that goodwill can be decomposed into value from long-term growth (*VLG*) and the remainder (*GWother*).

2.2.4 Summary of M&A price allocation and goodwill decomposition

$$\begin{aligned} PP &= BV + VSE + VLG \\ &= BV + FVadj + GW \\ &= BV + FVadj + GWother + VLG \end{aligned}$$

where *GWother=GW-VLG*

In summary, investors can identify three components (*BV*, *VSE*, and *VLG*) of purchase price based on a target's financial statement information. *BV* is readily available from the balance sheet, *VSE* estimated with the zero growth in residual earnings benchmark, and *VLG*, the uncertain growth expectation, which is the remainder. Investors can use *VLG* to decompose goodwill into goodwill other than the value from long-term growth (*GWother*) and *VLG*. Goodwill other than the value from long-term growth (*GWother*) is the difference between reported goodwill (*GW*) and the value from long-term growth (*VLG*). Appendix B provides a real case example of the M&A price allocation and goodwill decomposition.

2.3 Hypothesis development

2.3.1 Uncertain growth expectations and acquirers' future returns

The first research question to be examined is how much is paid for uncertain growth expectations in M&As, and whether this information has implications for acquirers' future long-term performance. To decide whether or not to buy a stock at its current market price, investors need a tool that can evaluate implicit growth uncertainties. If the current market price includes a lot of growth uncertainty, the investment is risky. Valuation studies in accounting provide a useful tool for evaluating implied growth uncertainties in stock price (Penman 2011) that enables investors to make buy-or-sell decisions based on accounting information that challenges market prices.

An M&A deal is characterized by a purchase price rather than market price. In order to evaluate and predict the success of an M&A deal, an investor needs to challenge the purchase price, which is usually determined not in the open market by numerous buyers and sellers, but in negotiations between sellers and a small number of bidders. Prior studies show that managers make many value-destroying M&A deals (Harford 2005; Oler 2008; Moeller et al. 2005) and pay higher premiums if their compensation is less tied to equity values (Datta et al. 2001), and Sirower (1997) shows paying a high premium to be negatively related to long-term stock returns. It is thus important to understand what acquirers are paying for targets and estimate implied uncertainties in the purchase prices when evaluating the acquirers' performance. I utilize valuation techniques to estimate the implied uncertainties in purchase prices and identify the attendant uncertain growth expectations as the value from long-term growth (*VLG*). Because *VLG* captures uncertainty in purchase prices, I expect it to be negatively related to acquirers' long-term returns.

Hypothesis 1a: The value from long-term growth (VLG) is negatively related to acquirers' long-term returns.

This study is motivated in part by the drawbacks of two popular measures used to evaluate M&A deals: deal announcement date returns (*AnnRet*), and premiums based on a target's market value (*Prem4wk*). These measures are based on targets' market values and subject to market conditions unrelated to fundamental characteristics of acquisitions (Bouwman et al. 2009). Premiums also fluctuate depending on the timing of a target's market value, and prior studies don't provide sufficient justification for when the market value of a target should be measured. *VLG*, because it is not based on market value, is not subject to these issues. I thus hypothesize that acquirers' future returns are better predicted by *VLG* than by deal announcement date returns (*AnnRet*) or premiums based on a target's market value (*Prem4wk*).

Hypothesis 1b: Acquirers' long-term returns are more closely associated with the value from long-term growth (VLG) than with deal announcement date returns (AnnRet) or premiums (Prem4wk).

If its implications were fully understood by investors and immediately reflected in stock prices, the value from long-term growth (*VLG*) would not be related to acquirers' long-term returns. Examining, in order to bolster Hypothesis 1a, how investors react to the value from long-

term growth (*VLG*) on deal announcement dates, I hypothesize the value from long-term growth (*VLG*) to be unrelated to returns around deal announcements.

Hypothesis 1c: The value from long-term growth (VLG) is not associated with event-date returns around M&A deal announcements.

2.3.2 Uncertain growth expectations and goodwill accounting

The second question to be examined is whether the uncertain growth expectations of purchase prices have implications for goodwill accounting. I argue that they provide a benchmark for reported goodwill.

Managers have incentives to over-allocate to goodwill because of new accounting rules governing business combinations (SFAS 141) and intangible assets (SFAS 142)[5] The new business combination accounting includes discretion that can be opportunistically exploited by managers through estimation of the fair value of net identifiable assets.[6] I suggest that mangers have incentives to reduce the fair value of net identifiable assets. SFAS 141 requires acquirers to estimate the fair value of acquired assets and liabilities including, if they are legally transferable

[5] Before SFAS 141, companies in business combinations chose between the pooling of interests and purchase (when accompanied by an exchange of stock) methods. Under the pooling of interests method, two companies' assets and liabilities are simply combined. More important, "aggregate income is not changed since the total resources are not changed" (APB Opinion 16, par. 28). Under the purchase method, acquirers estimate the fair value of net identifiable assets and record the difference between it and the purchase price as goodwill, amortized and expensed for no more than 40 years. Thus, short-term earnings are less in the purchase than in the pooling of interests method.

[6] Another issue is estimation of the market value of carrying goodwill for impairment tests. Prior studies that examine the second issue, which can be interpreted as whether companies recognize goodwill impairments in a timely manner (Hayn and Hughes 2006; Li and Sloan 2011; Lys et al. 2012; Ramanna and Watts 2012), show that companies do not fully recognize impaired goodwill in a timely manner. This study examines the former issue, the estimation of fair value of net identifiable assets.

or separable, intangible assets. Goodwill being the difference between purchase price and the fair value of net identifiable assets, understatement of the latter results in overstatement of goodwill, which, given that goodwill is not amortized under SFAS 142, results in lower short-term expenses that increase earnings. Thus, not all components of goodwill are at same level of impairment risk. The uncertain growth expectations indicate the portion of goodwill not based on a target's value that is more likely to be impaired. The uncertain growth expectations of purchase prices are also not associated with the issue of goodwill allocation because the latter is not decided by managers. This leads to my second hypothesis.

Hypothesis 2a: The value from long-term growth (VLG) is correlated with future goodwill impairments.

As I did to test Hypothesis 1b, I examine whether uncertain growth expectations perform better than deal announcement date returns and premiums in predicting future goodwill impairments.

Hypothesis 2b: Future goodwill impairments are more closely related to the value from long-term growth (VLG) than to deal announcement date returns (AnnRet) or premiums (Prem4wk).

Section 3: Research Design

I present here the empirical models that test the hypotheses.

3.1 Test of uncertain growth expectations and acquirers' future returns

I test Hypothesis 1a by examining movements in cumulative raw and size adjusted returns for three portfolios formed on the basis of *VLG* after deal announcements. This measure indicates the percentage of uncertain growth expectations over purchase price. I report mean cumulative raw and size-adjusted returns for these three portfolios for up to 24 months. I further test whether *VLG* provides additional explanatory power on future returns over the four well-known risk factors related to stock returns. Control variables related to the performance of acquirers are included in the model. I run a cross-sectional regression with equation (1) for cumulative raw and size adjusted returns of one year and two years after deal announcement.

$$\begin{aligned} Ret_{t+i} &= b_0 + b_1 VLG + b_2 AnnRet + b_3 Prem4wk \\ &+ b_4 Beta + b_5 Size + b_6 BTM + b_7 MOM \\ &+ b_8 Focus + b_9 PctStock + b_{10} OVI \\ &+ b_{11} PctStock \cdot OVI + b_{12} RelSize + e \end{aligned} \tag{1}$$

where Ret_{t+i} is size adjusted cumulative abnormal returns for year *i* after deal announcement; *VLG* is value from long-term growth; *AnnRet* is value-weighted cumulative abnormal returns around deal announcements (three days); *Prem4wk* is the premium paid by acquirers based on the market price of the target four weeks prior to deal announcement (rescaled by purchase price);

Beta is estimated from a regression of monthly returns ($R - R_f$) on market returns ($R_m - R_f$) using the 36-month return period; *Size* is the log market value of the acquirer. *BTM* is acquirers' book-to-market ratio before the deal announcement; *MOM* is the size adjusted cumulative abnormal returns for the six month period before the deal announcement; *Focus* is an indicator variable equal to one if the two-digit SIC codes of target and acquirer are the same; *PctStock* is the percentage of payment made with stocks; *OVI* is an overvalued share indicator variable which is equal to one if the acquirer's industry-adjusted price-to-earnings ratio is in the first quintile, zero otherwise; *RelSize* is the relative size of a deal over the market value of an acquirer.

I test *Hypothesis 1b* by comparing the coefficients on *VLG*, *AnnRet*, and *Prem4wk*. If *VLG* is better at predicting acquirers' long-term returns, Ret_{t+i} should be more closely associated with *VLG* than with *AnnRet* and *Prem4wk*.

I next examine whether investors immediately reflect the implications of *VLG* for M&A deals. I test with *Hypothesis 1a* the relationship between *VLG* and long-term returns (one and two year cumulative raw returns after deal announcements). If *VLG* has implications for M&A deals, and investors immediately understand these implications, stock prices around event dates should reflect the information. I test whether *VLG* is related to event-date returns around deal announcements, that is, *Hypothesis 1c*, using the following model:

$$\begin{aligned} AnnRet = {} & b_0 + b_1 VLG + b_2 Prem4wk + b_3 Focus \\ & + b_4 PctStock + b_5 OVI + b_6 PctStock \cdot OVI + b_7 RelSize + e \end{aligned} \tag{2}$$

where *AnnRet* is the value-weighted Cumulative Abnormal Return around deal announcement (three days); *Prem4wk* is the premium paid by acquirers based on the target's market price four weeks prior to deal announcement (rescaled by purchase price); *Focus* is an indicator variable equal to one if the two-digit SIC codes of target and acquirer are the same; *PctStock* is the percentage of payment made with stocks; *OVI* is an overvalued share indicator variable which is equal to one if the acquirer's industry-adjusted price-to-earnings ratio is in the first quintile, zero otherwise; and *RelSize* is the relative size of a deal over the market value of an acquirer.

If investors immediately and fully understand the implications of *VLG*, I expect the coefficient on *VLG* (β_1) to be negative and significant.

3.2 Test of goodwill impairments

I test Hypothesis 2a and 2b using the following logistic regression model.

$$\begin{aligned} Logit(GWI) = {} & b_0 + b_1 GW + b_2 GWother + b_3 VLG \\ & + b_4 AnnRet + b_5 Prem4wk + b_6 Size + b_7 Ret \\ & + b_8 Focus + b_9 PctStock + b_{10} OVI + b_{11} PctStock \cdot OVI \\ & + Year + targetSIC + e \end{aligned} \tag{3}$$

where *GWI* is an indicator variable equal to one if goodwill impairment of the identified target is reported in any year after the merger or acquisition; *GW* is the portion of the purchase price

allocated to goodwill[7]; *GWother* is the difference between value from long-term growth (*VLG*) and *GW*; *VLG* is the value from long-term growth; *GW*, *VLG*, and *GWother* are scaled by purchase price (*PP*); *AnnRet* is the value-weighted Cumulative Abnormal Return around deal announcement (three days); *Prem4wk* is the premium paid by acquirers based on the target's market price four weeks prior to deal announcement (rescaled by purchase price); *Size* is the acquier's log market value; *Ret* is acquirers' size adjusted cumulative abnormal returns over 12 month period after deal announcements; *Focus* is an indicator variable equal to one if the two-digit SIC codes of target and acquirer are the same; *PctStock* is the percentage of payment made with stocks; and *OVI* is an overvalued share indicator variable which is equal to one if the acquirer's industry-adjusted price-to-earnings ratio is in the first quintile, zero otherwise; *Year* is a year fixed effect dummy; and *targetSIC* is the target's two-digit SIC code.

Equation 3 tests the relationship between goodwill impairments (*GWI*) and both goodwill (*GW*) and goodwill components (*GWother*, and *VLG*). Prior studies have shown higher premiums to result in goodwill impairments (Hayn and Hughes 2006, Li et al. 2011). Following this line of research, a premium measure (*Prem4wk*) is included in the model. Additional controls include acquirer size and focused mergers and acquisitions (*Focus*). Gu and Lev (2011) find managers with overpriced shares to be more likely to pay more for a target, and overpriced shares to tend to drive a higher likelihood of future goodwill impairment. Following these findings, I control for method of payment (*PctStock*) and acquirers' overpricing of shares (*OVI*). If payment for overpriced shares is related to goodwill impairment, I expect the coefficient on

[7] Following Shalev et al. (2013), I define goodwill as the sum of the amount of goodwill disclosed in 10-Ks and the indefinite life of intangibles.

the interaction between *PctStock* and *PE* to be positive and significant. Year and target industry fixed effects are also included in the model.

In this model, which tests *Hypothesis 2a*, positive coefficients on the variables indicate that the likelihood of goodwill impairment increases as goodwill (or its components) increases. My main focus is the coefficient on goodwill (*GW*) and value from long-term growth (*VLG*). I expect positive and significant coefficients on *GW*, which can be interpreted as the probability of impairment increasing as overall goodwill increases. A positive and significant relationship between value from long-term growth (*VLG*) and goodwill impairment (*GWI*) suggests that *VLG* captures the portion of goodwill more at risk of being impaired.

I test *Hypothesis 2b* by comparing the coefficients and t-statistics of the *VLG*, *AnnRet*, and *Prem4wk* variables. I expect the value from long-term growth (*VLG*) to be positively associated with goodwill impairment, and goodwill impairment to be more closely related to *VLG* than to *AnnRet* and *Prem4wk*.

Section 4: Data

4.1 Sample selection

The initial sample is collected from the Thomson SDC Platinum mergers and acquisitions database. I consider only mergers and acquisitions announced between June 30, 2001, the effective date of SFAS 141, and December 31, 2009. Before SFAS 141, acquirers could choose

between the pooling and purchase (when share exchange is involved) methods of business combination accounting. SFAS 141 eliminated the pooling method and required all business combinations to be accounted for by the purchase method. All observations in my sample period, being accounted for by the purchase method, are thus comparable. I also require both acquirers and targets to be traded on major U.S. stock markets (NYSE, NASDAQ, and AMEX), and include only deals worth at least $10 million that involve acquisition of 100% of a target's shares. If either acquirer or target is in the financial industry (SIC 6000-6999), the observation is excluded from the sample.

From a sample of 708 acquisitions that satisfy these requirements, a final sample of 423 observations remains after matching with COMPUSTAT, Firstcall actual announcement date, and I/B/E/S analyst forecasts with at least two-year forecasting horizons. Firstcall actual announcement dates are required to confirm a target's last financial statement before deal announcement. I/B/E/S consensus analyst forecasts proxy for one and two year earnings after the last financial statement report in the residual earnings model. I require that deal announcements for multiple acquisitions be at least 36 months apart. Purchase price allocation data was hand collected from 10-K filings found in the SEC EDGAR website. From the 423 observations, 243 merger and acquisition cases were identified.

I recognize in these observations goodwill impairment firm years in which companies report pretax impairments of goodwill (GDWLIP). Because Compustat does not provide detailed information about goodwill impairments, including all recognized goodwill impairments in a reported year, in order to compare an initial purchase price allocation and subsequent goodwill

impairment I need to verify, with purchase price allocation data, whether a reported goodwill impairment is related to a specific acquisition.

To confirm the relationship between price allocation and future goodwill impairment, I manually check, for every case, whether the reported goodwill impairment is related to the acquisition in the sample. Some companies associate specific acquisitions with reported goodwill impairments. In the many cases in which companies do not identify which prior mergers or acquisitions are related to goodwill impairments, I compare the business of the segment reporting goodwill impairment and business of the target company in the sample. If they are similar, I assume the goodwill impairment to be related to the target in the sample. Because I define goodwill as the sum of goodwill disclosed in 10-Ks and indefinite life intangibles, asset-write downs related to the latter are treated as goodwill impairments. The final sample includes 215 observations. Table 1 summarizes the sample selection process.[8]

4.2 Variable estimation

I explain the estimation procedure for *VSE* and *VLG*.

$$BV_t = BV_{t-1} + Earnings_t - Dividend_t$$

$$RE_t(Residual\ Earnings_t) = Earnings_t - (1 - r) \cdot BV_{t-1}$$

[8] The size of the final sample is slightly smaller than in Shalev et al. (2013), which also requires purchase price allocation data.

where, $\rho = Cost\ of\ Capital + 1$

Book value (BV) [9] is common shareholders' equity following Nissim and Penman (2001). Following Frankel and Lee (1998) and Ali et al. (2003), I/B/E/S consensus analysts' earnings estimates proxy for future earnings. Because I use a two-period residual earnings model, analyst forecasts for the next two periods are required in the sample. Dividends per share (DVPSP) are used to calculate the dividend payout ratio, which is assumed to be constant for the second year. In the main analysis, similar to Penman and Sougiannis (1998), non-company specific cost of capital is used (risk free rate (10-year T-bill rate) together with a 5% risk premium)[10].

To decompose goodwill, purchase price (*PP*) and goodwill (*GW*)[11] were hand-collected from SEC 10-K filings. Because acquirers are required to immediately expense acquisition costs included in the purchase price before SFAS 141R was introduced, reported acquisition costs are added to purchase prices for deals made after December 15, 2008 (the effective date of SFAS 141R). If expensed acquisition costs are not reported, I add an additional two percent of purchase price is the average of reported acquisition cost over purchase price in the sample. to the purchase price. If I/B/E/S analyst forecasts predict negative future earnings, *VSE* turns negative[12] and is replaced with zero. *VLG* is calculated by subtracting *BV* and *VSE* from *PP*.

[9] The calculation of *BV* is explained in Appendix A.
[10] Other possible future earnings estimates and an alternative way of estimating the cost of capital are discussed in Section 5 as robustness tests.
[11] Indefinite life intangibles are included in the amount of reported goodwill because, like goodwill, they are not amortized.
[12] Additional analysis of the negative *VSE* sample is in the robustness section.

4.3 Summary statistics

Table 2, panel A reports basic descriptive statistics. Average purchase price is about $2,240 million, with companies allocating slightly more than half of purchase price to goodwill. About 27 percent of acquirers in the sample report goodwill impairments (*GWI*). Book value (*BV*) of the target counts for about 39 percent of purchase price. The portion of uncertain growth expectations over purchase price (*VLG*) is about 47 percent. The difference (*GWother*) between goodwill (*GW*) and uncertain growth expectations (*VLG*) is, on average, about 10 percent of purchase price. Acquirers that report M&A deals experience, on average, negative market reactions (-3 percent) on three-day windows around deal announcements (*AnnRet*). The average premium (*Prem4wk*) of 33 percent is based on target prices four weeks prior to deal announcement, rescaled by purchase price. About 70 percent of mergers and acquisitions are made within the same industry (*Focus*) and about 41 percent of purchase prices paid with the acquirer's stock (*PctStock*). The average deal size over the market value of an acquirer is about 40 percent (*RelSize*).

Table 2, panels B and C report descriptive statistics for the non-impairment and impairment samples. *PP* and *GW* are slightly higher for the impairment sample. Interestingly, average *VLG* is greater in the non-impairment than in the impairment sample, but this difference in the means is not statistically significant, variance in these variables being high. Only acquirer *VSE, Size, OV* and *RelSize* are statistically different in the non-impairment and impairment samples.

Table 3 summarizes correlations between the analyzed variables. The upper (lower) diagonal reports Pearson (Spearman) correlations. Goodwill impairment is negatively correlated

with *VLG*, but positively correlated with *GW* and *GWother*. That *VLG* is negatively correlated with goodwill impairments is surprising, and can be interpreted as positive synergy effects. As expected, *VLG* and *AnnRet* are almost not correlated. However, I am interested in multivariate rather than univariate relations. To avoid multicollinearity problems, explanatory variables in the estimation models are carefully selected. In untabulated results, the variance inflation factors (VIF) that test the multicollinearity problem are below 10 for all variables in every estimation model in the study.

Section 5: Results

5.1 Empirical Findings

5.1.1 Results of uncertain growth expectations and acquirers' future returns

Figure 2 illustrates the mean Cumulative Raw Returns (panel A) and size-adjusted Cumulative Abnormal Returns (panel B) of three portfolios for 24 months after deal announcement.[13] Table 4 reports numerical values of them. Three portfolios are formed on the basis of the value from long-term growth (*VLG*), being the percentage of uncertain growth expectations in purchase prices, which I expect to predict future returns. If all implications of *VLG* are reflected in stock prices after deal announcements, there should be no relationship between *VLG* and future returns.

[13] Six companies in the sample were delisted during the 24 months, merger being the delisting reason for all six. Similar to Penman and Reggiani (2013), the CRSP delisting return is applied for the first month and reinvestment at the risk-free rate assumed. See also Shumway (1997).

Figure 2 shows the mean the mean Cumulative Raw Returns and size-adjusted Cumulative Abnormal Returns to be negatively correlated with *VLG*. The mean the mean Cumulative Raw Returns and size-adjusted Cumulative Abnormal Returns are low for companies with high, and high for companies with low, *VLG*. Although this relationship is less strong for the first five months, the negative relations between *VLG* the mean Cumulative Raw Returns and size-adjusted Cumulative Abnormal Returns hold for long-term returns. I interpret these findings as investors not fully understanding and reflecting the implications of uncertain long-term growth expectations in purchase prices (*VLG*) at the time of deal announcements.

Table 5 confirms the findings reported in Figure 2 and Table 4. Table 5, panel A reports the empirical results from the estimation of Model 1 with size adjusted cumulative abnormal returns (Ret_{t+1}) for one year since deal announcement. Robust standard errors are used in the estimation. The negative and significant relationship observed in column (1) between *VLG* and one-year size adjusted cumulative abnormal returns (Ret_{t+1}) is reported conditional on the market beta (*Beta*), size (*Size*), and book-to-market (*BTM*). Column (2) shows *VLG* to be negatively associated with Ret_{t+1}, even when momentum measure (*MOM*) is included in the model. The coefficients on *VLG* are -0.21 and -0.22 for column (1) and (2) respectively. These findings suggest that if an acquirer pays one percent more for uncertain growth expectations (*VLG*) in purchase prices acquirers' long-term returns would be decreased by about 0.2 percent one year after deal announcements. Prior studies use deal announcement date returns (*AnnRet)* and premiums (*Prem4wk*) to measure the long-term performance of M&A deals. When *AnnRet* and *Prem4wk* are included in the model, in column (3), the coefficient on *VLG* is negative and

significant, but *AnnRet* and *Prem4wk* are not significant. This finding suggests that future acquirer performance is better predicted by *VLG* than by *AnnRet* or *Prem4wk*. The negative and significant relationship in column (4) between *VLG* and Ret_{t+1} holds even when the control variables (*Focus*, *PctStock*, *OVI*, the interaction between acquirers' *PctStock* and *OVI*, and *RelSize*) are included in the model. The negative coefficient on *PctStock* is as expected, but the positive coefficient on the interaction between acquirers' *PctStock* and *OVI* is surprising.

Table 5, panel B shows the relationship between *VLG* and size adjusted cumulative abnormal returns (Ret_{t+2}) for two years since deal announcement. *VLG* is negatively and significantly related to two-year size adjusted cumulative abnormal returns (even when four risk factors; *Beta*, *Size*, *BTM*, and *MOM* are included in the models). In column (3), *AnnRet* is also negatively and significantly, but less significantly than *VLG*, related to Ret_{t+2}. These findings suggest that the explanatory power of *VLG* for long-term returns is incremental to the four risk factors and to *AnnRet* and *Prem4wk*.

Table 6 reports the empirical tests of *Hypothesis 1c* and Model 2. That *VLG* is not significantly related to *AnnRet* suggests that investors do not fully understand the implications of *VLG* in purchase prices at the time of deal announcements, and that stock prices do not immediately reflect this information. In the second column, both *VLG* and *Prem4wk* are insignificant. Taken together with the findings reported in Table 5, this finding confirms that investors do not immediately understand the implications of *VLG* for M&A deals.

5.1.2 Results of goodwill impairment tests

Table 7 reports the empirical results from the estimation of equation 3, a logistic regression model that examines the relation between goodwill impairment and purchase price allocation items with control variables. The first two columns of Table 7 provide estimation results for the relation between goodwill (*GW*) and goodwill impairment (*GWI*). Similar to findings in Hayn and Hughes (2006) and Li and Sloan (2011), the coefficient on *GW* is positive (1.34) but slightly insignificant. The interpretation of the positive relation between *GW* and *GWI* is straightforward. If companies record more goodwill, the probability of reporting goodwill impairment increases. However, this relationship is not strong as reported in prior studies. The negative coefficient on *Size* suggests that the probability of goodwill impairments decreases as acquirers become larger. Following Gu and Lev (2011), who document that companies that use overpriced shares in mergers and acquisitions are more likely to report goodwill impairments, I add the percentage of deal amount paid with stock (*PctStock*) and a proxy for overpriced shares of acquirer (*OVI*). The interaction between *PctStock* and *OVI* are negatively associated with goodwill impairment, but the relationships are insignificant, and the coefficient on *OVI* is negatively correlated with goodwill impairment. To examine whether market reactions and premiums have implications for goodwill impairment, market reactions on deal announcement dates (*AnnRet*) and premiums (*Prem4wk*) are included in the model (the second column of Table 7). I find neither to be significantly related to goodwill impairment.

The estimation results of equation 3 with decomposed goodwill items are presented in Table 7, columns (3) and (4). Column (3) reports the result for a test of *Hypothesis 2a*. In this model, I replace goodwill with value from long-term growth (*VLG*), which I expect to be positively related to goodwill impairment, and the remainder (*GWother*). The coefficients on *VLG* and *GWother* are positive, but only *VLG* is significantly associated with goodwill

impairment. This finding suggests that *VLG* captures a portion of goodwill that is related to goodwill impairment. In column (4), market reactions on deal announcement dates (*AnnRet*) and premiums (*Prem4wk*) are included in the model. *VLG* is still positive (2.28) and significant after controlling for *AnnRet* and *Prem4wk, GWother* positive but not significant. *AnnRet* is negative and insignificant, *Prem4wk* positive and insignificant. That columns (3) and (4) have the same $PseudoR^2$ s means that *AnnRet* and *Prem4wk* do not add any explanatory power to the model.

In column (5) and (6), the explanatory powers of *GW* and *VLG* on goodwill impairments are compared. When both measures are included in the model, only *VLG* is positive and significant. This means that *VLG* is better in predicting goodwill impairments than *GW*. If *AnnRet* and *Prem4wk* are included in the model, *VLG* is the most closely related to the dependent variable, even it is slightly insignificant (P-value 11%), than other variables (*GW, AnnRet,* and *Prem4wk*).

In summary, the findings in Table 7 show the uncertain growth expectations of purchase prices (*VLG*) to be positively related to goodwill impairments. *VLG* captures the components of goodwill that hamper profitability. In other words, the new method introduced in this paper provides a useful tool to identify a portion of goodwill that predicts future impairments.

5.2 Robustness tests

5.2.1 Goodwill and value from long-term growth in predicting long-term returns

In this section, I test whether *GW* and its components predict long-term returns. In real world M&A cases, it takes one or more years for acquirers to allocate purchase prices. Therefore,

investors do not know the amount of allocated goodwill at the time of deal announcements, and they cannot use goodwill as a predictor for long-term returns. With ex-post reported goodwill (*GW*), I assume that *GW* is available at the time of deal announcement and test whether *GW* and its components (*GWother* and *VLG*) predict long-term returns. I also examine whether *VLG* is better than *GW* in predicting long-term returns.

$$\begin{aligned} Ret_{t+i} &= b_0 + b_1 GW + b_2 GWother + b_3 VLG \\ &+ b_4 AnnRet + b_5 Prem4wk \\ &+ b_6 Beta + b_7 Size + b_8 BTM + b_9 MOM \\ &+ b_{10} Focus + b_{11} PctStock + b_{12} OVI + b_{13} PctStock \cdot OVI + e \end{aligned} \tag{4}$$

where all variables are as defined in equation (1) and (3).

Table 8 reports the estimation results for equation (4). One-year size adjusted cumulative abnormal returns (Ret_{t+1}) is used as a dependent variable for columns (1), (2) and (3), two-year size adjusted cumulative abnormal returns (Ret_{t+2}) for columns (4), (5), and (6). Columns (1) and (4) show that *GW* is not significantly associated with long-term returns. If *GW* is decomposed into *GWother* and *VLG*, only *VLG* is negatively and significantly related to long-term returns (column 2). When *GW* and *VLG* are included in the model at the same time, *VLG* predicts long-term returns while *GW* does not (columns 3 and 6). In summary, these findings suggest that, similar to goodwill impairment tests, *VLG* captures a portion of *GW* that has negative implications on future returns, and *VLG* is better than *GW* in predicting acquirers' long-term returns.

5.2.2 Companies with negative value from predictable short-term earnings

In the main analysis, I replace with zero any negative value from predictable short-term earnings (*VSE*). Equation (4), below, tests whether the relationship between value from long-term growth (*VLG*) and size adjusted cumulative abnormal returns (Ret_{t+i}) differs for companies with a negative value from predictable short-term earnings.

$$\begin{aligned} Ret_{t+i} &= b_0 + b_1 VLG + b_2 NegVSE + b_3 VLG \cdot NegVSE \\ &+ b_4 AnnRet + b_5 Prem4wk \\ &+ b_6 Beta + b_7 Size + b_8 BTM + b_9 MOM \\ &+ b_{10} Focus + b_{11} PctStock + b_{12} OVI + b_{13} PctStock \cdot OVI + e \end{aligned} \tag{5}$$

where *NegVSE* is equal to 1 if *VSE* is less than zero, and 0 otherwise. Other variables are as defined in Model (1).

Table 9 reports the estimation results. One-year size adjusted cumulative abnormal returns (Ret_{t+1}) is used as a dependent variable for columns (1) and (2), two-year size adjusted cumulative abnormal returns (Ret_{t+2}) for columns (3) and (4). As expected, *VLG* is negatively and significantly related to one-year size adjusted cumulative abnormal returns. *NegVSE* and its interaction with *VLG* are not significantly related with the dependent variable. Interestingly, *NegVSE* is positively and significantly related to two-year size adjusted cumulative abnormal returns. This finding suggests that companies that acquire targets with negative residual earnings perform better than companies that acquire targets with non-negative residual earnings. The

interactions between *VLG* and *NegVSE* are negative for all estimations. The coefficients on this interaction are negatively and significantly related only to two-year size adjusted cumulative abnormal returns. That the absolute value of the interaction term is larger than the absolute value of *NegVSE* means that the overall effect of *NegVSE* on two-year size adjusted cumulative abnormal returns is negative.

5.2.3 Value of targets and its components in predicting long-term returns

In section (2), using valuation techniques, I decompose M&A purchase prices into three things: book value (*BV*), the value from short-term earnings (*VSE*), and the value from long-term growth (*VLG*). Since *VLG* is not justifiable with current accounting information, it indicates uncertain growth expectations in purchase prices. It is documented in a previous section that *VLG* is negatively related to future long-term returns. In this section, I test how the other portion (*TgtVal*) of purchase prices, which is justifiable with current accounting information (*BV* and *VSE*), is associated with long term returns.

$$\begin{aligned} Ret_{t+i} &= b_0 + b_1 TgtVal + b_2 BV + b_3 VSE \\ &+ b_4 AnnRet + b_5 Prem4wk \\ &+ b_6 Beta + b_7 Size + b_8 BTM + b_9 MOM \\ &+ b_{10} Focus + b_{11} PctStock + b_{12} OVI + b_{13} PctStock \cdot OVI + e \end{aligned} \tag{6}$$

where *TgtVal* is the value of a target, which is the sum of *BV* and VSE. Other variables are as defined in Model (1)

Table 10 reports the estimation results for equation (6). Since *TgtVal* is the rest of purchase prices other than *VLG,* I expect positive relations between *TgtVal* and long-term returns. As expected, *TgtVal* is positively and significantly related to long-term returns. Then, I test which components of *TgtVal* are related to long-term returns. When I decompose *TgtVal* into *BV* and *VSE,* coefficients on both *BV* and *VSE* are positive but only *BV* is significantly associated with long-term returns. These findings suggest that acquirers' long-term returns are higher as they pay more for values based on justifiable accounting numbers, and this relationship is mostly from buying targets' book value.

5.2.4 Alternative future earnings

I test the main results' robustness to alternative future earnings proxies by examining the main results with other proxies for future earnings, namely, one year lead on analysts' forecasts and current core earnings. Current core earnings is the difference between comprehensive net income and unusual operating income (UOI), the latter defined as in Nissim and Penman (2001).

VLG measures estimated with these two alternative future earnings proxies nicely predict and differentiate from the other groups returns for the lowest *VLG* portfolio. Conversely, cumulative abnormal returns for the medium and high *VLG* groups are not distinctively different. These other *VLG* measures estimated with the two alternative future earnings proxies are positively and significantly related to goodwill impairments suggests that the main findings are not driven by a specific measure of expected future earnings.

5.2.5 Additional robustness tests

Lastly, I check that the findings are not driven by extreme values by performing the main analysis with both winsorized and truncated samples at the 1 and 2 percent levels. That the main and reported results are similar suggests that they are not sensitive to outliers.

Section 6: Conclusions

This study introduces a new approach to evaluate M&A deals that enables investors to find out how much they paid for uncertain growth expectations (*VLG*) when an acquirer buys another company. I document two implications or uncertain growth expectations (*VLG*) for acquirers' future performance, (1) a negative relation to long-term returns, and (2) a positive relation to future goodwill impairments, and find *VLG* to be a better predictor of future acquirer performance than other measures commonly used to evaluate M&A deals (e.g., market reactions on deal announcement dates and premiums on a target's market value). In summary, the new method and findings described in this paper suggest that investors do not fully incorporate the implications of targets' accounting information for the future performance of acquirers.

This paper contributes to the literature by providing a way to evaluate M&A deals using information from both balance sheets and income statements. It also provides a measure that can predict, based on publicly available data, acquirers' future performance, and identifies portions of goodwill that predict future goodwill impairments. The accounting approach introduced in this study thus provides a highly effective tool for evaluating merger and acquisition deals that is useful to researchers and practitioners alike.

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Appendix A: Variable Definitions

This appendix provides definitions and descriptions of the variables used in this study.

Variable	Definition	Description
GWI	Goodwill impairment	Indicator variable equal to 1 if a company reported goodwill impairment related to the target with purchase price allocation data in any year after the merger or acquisition, 0 otherwise. When a company does not explicitly disclose the acquisition related to the impairment, the relationship between the target and the impairment is checked manually. If the business of the segment reporting goodwill impairment is similar to the business of the target before the combination, the impairment is assumed to be related to the target. *GWI* also includes write-downs of indefinite life intangibles.
PP	Purchase price (in $ millions)	Purchase price as reported in the acquiring company's 10-K. Reported acquisition costs are added to purchase prices for deals made after December 15, 2008 (effective date of SFAS 141R). If expensed acquisition cost is not reported, 2.7% of purchase price (average reported acquisition cost over purchase price in the sample) is added to purchase price.
BV	Book Value (scaled by PP)	Common shareholders' equity (CSE)/ Common shares outstanding (CSHO) CSE is defined following the appendix in Nissim and Penman (2001): CSE=Common equity (CEQ)+Preferred treasury stock (TSTKP)-Preferred dividends in arrears (DVPA). If CSHO is missing, Common shares used to calculate basic earnings per share (CSHPRI) replaces CSHO.
VSE	Value from predictable short-term earnings (scaled by PP)	Sum of discounted first period earnings and capitalized second period earnings with no growth assumption. If negative, *VSE* is replaced with zero.
VLG	Value from long-term growth (scaled by *PP*)	Purchase price (*PP*)-Book value (*BV*)-Value from short-term accounting (*VSA*).
FVadj	Fair value adjustment (scaled by *PP*)	Fair value of net identifiable assets (*FVadj*) =Purchase price (*PP*)-Goodwill (*GW*)-Book value (*BV*).

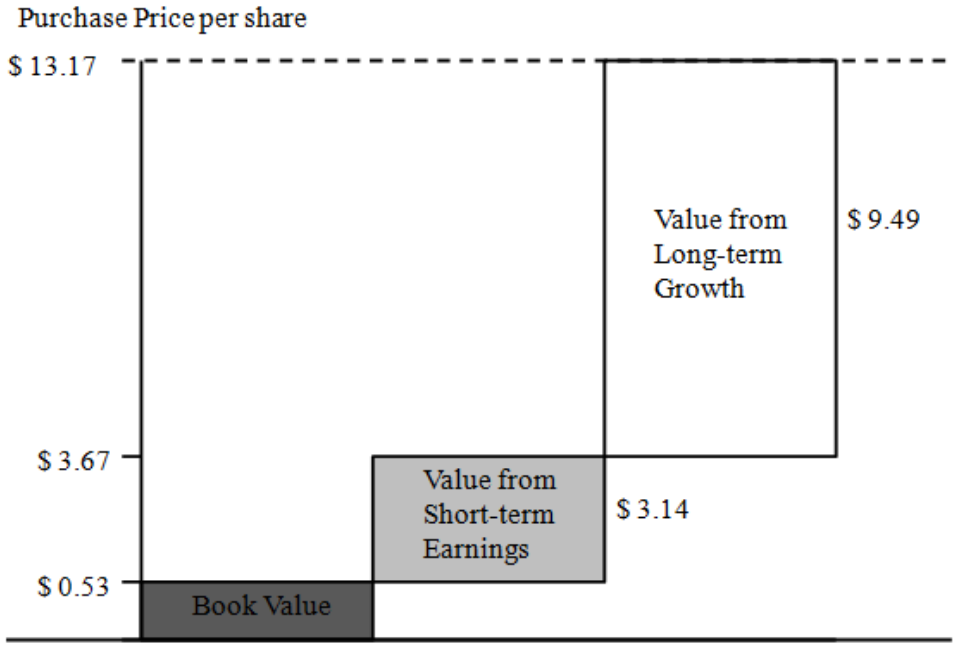
Appendix A (Continued)

Variable	Definition	Description
GW	Goodwill (scaled by *PP*)	The amount of purchase price allocated to goodwill as reported in the acquiring company's10-K and the amount of indefinite life intangibles.
GWother	Goodwill other than the value from long-term growth (scaled by *PP*)	The difference between the value from long-term earnings (*VLG*) and goodwill (*GW*).
AnnRet *(Acquirer)*	Announcement date returns of acquirers	*AnnRet* is the value-adjusted Cumulative Abnormal Returns (three days) around deal announcements. The following trading day is taken as the announcement date for deals announced on a non-trading day.
Prem4wk	Acquisition premium	*Prem4wk* is the amount of premium based on the price of a target four weeks prior to deal announcement.
Beta	Beta of acquirer	*Beta* is estimated from a regression of monthly returns ($R - R_f$) on market returns ($R_m - R_f$) using the 36-month return period.
Size	Size of acquirer	Logarithm of the market value of the acquirer. (MKVALT)
BTM	Book-to-Market ratio of acquirer	*BTM* is acquirers' book-to-market ratio (CSE/Mkvalt) before deal announcements.
MOM	Momentum measure of acquirer	*MOM* is the size adjusted cumulative abnormal returns for the six month period before deal announcements.
Focus	M&A focus	Indicator variable equal to 1 if two-digit SIC codes of target and acquirer are the same, 0 otherwise.
PctStock	Percentage of stock payment	Percentage of payment in mergers and acquisitions deals made with stock.
OV	Overpriced share	Similar to Gu and Lev (2011), *OV* is price(PRCC) to earnings(EPSPX) ratio adjusted for industry average. Industry means that companies have the same four digit SIC code. A *OV* less than 0 is replaced with 0, a *OV* greater than 100 replaced with 100.
OVI	Indicator variable of overpriced share	Overvalued share indicator variable which is equal to one if the acquirer's industry-adjusted price-to-earnings ratio (*OV*) is in the first quintile, zero otherwise
RelSize	Relative deal size over the size of acquirer	*RelSize* is the relative size of a deal over the market value of an acquirer. (*PP/MKVALT*)

Appendix B: An Example of Finding the Speculative Portion of a Purchase Price

Identix Inc. merged with Visionics Corp. (Both are in the biometrics industry.) The deal was announced on February 22, 2002 and closed on June 26, 2002. Purchase price was $334.8 million and Identix recorded $273.1 million in goodwill.

Figure A: Building blocks that identify the speculative expectations for Identix Inc. (the diagram follows Penman (2011, p. 68))



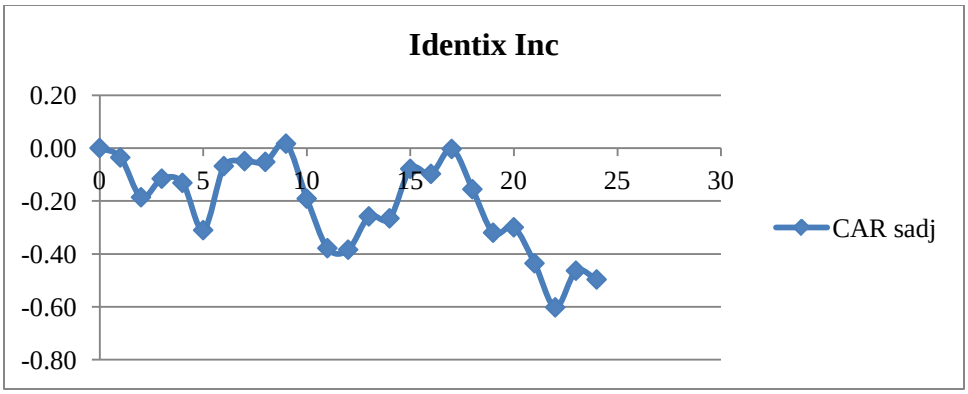
The purchase was $13.17 per share, Visionics' book value per share $0.53. Analysts following Visionics forecasted that its EPS would be $-0.02 for fiscal year 2002 and $0.4 the following year. Visionics did not pay any dividends, and the risk free rate in February 2002 was 4.91%. Value from short-term earnings (*VSE*) is estimated as

$$VSE = \frac{(EPS_1 - r \cdot BPS)}{1+r} + \frac{(EPS_2 - r \cdot BPS_1)}{(1+r)\cdot r} = \frac{-0.07}{1.1} + \frac{0.35}{1.1 \cdot 0.1} = -0.06+3.20=3.14 .$$

Value from long-term growth (*VLG*) is *Purchase Price - (BPS+VSE)= 9.49. GWother* , the difference between the reported goodwill ($10.74 per share) and *VLG* ($ 9.49), is $1.25 per share.

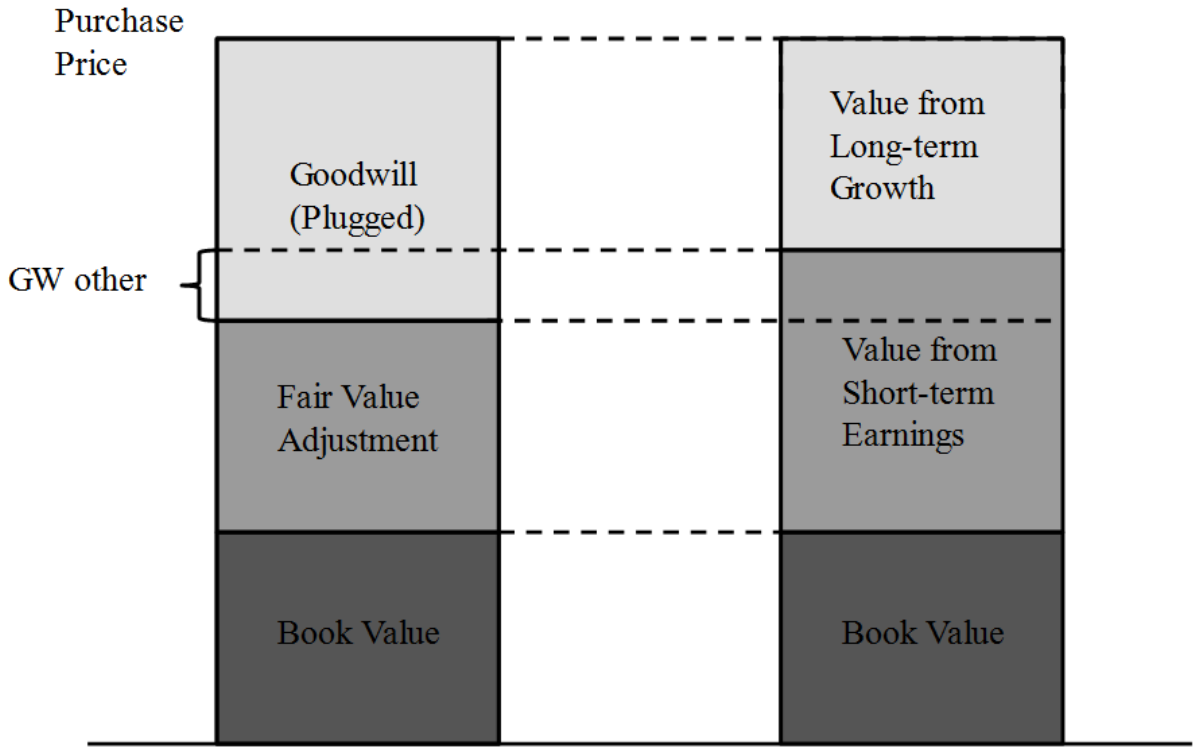
Appendix B (Continued)

Figure B: Monthly size-adjusted cumulative abnormal returns of Identix for 24 months after deal announcement



Based on the size-adjusted cumulative abnormal returns, the merger was not successful; Identix reported a goodwill impairment related to the Visionics merger in 2003.

Figure 1: Purchase Price Allocation Based on GAAP and the New Method



This figure compares the decomposition of purchase prices based on current GAAP accounting (left column) with the new method introduced in the paper (right column). The left column shows goodwill to be a plugged number after the fair value of net identifiable assets is estimated. In the right column, the value from short-term earnings (*VSE*) is the value of a target based on predictable short-term earnings estimated with a no-growth assumption ($VSE = \frac{RE_1}{\rho} + \frac{RE_2}{\rho(\rho-1)}$). The dotted line between goodwill and value from long-term growth indicates that goodwill can be decomposed into value from long-term growth (*VLG*) and the remainder (*GWother*).

Figure 2: Mean Post Deal Announcement Returns

Figure 2 A. Mean Cumulative Raw Returns for three portfolios based on the percentage of uncertain growth expectations (*VLG*) in the purchase prices (*PP*)

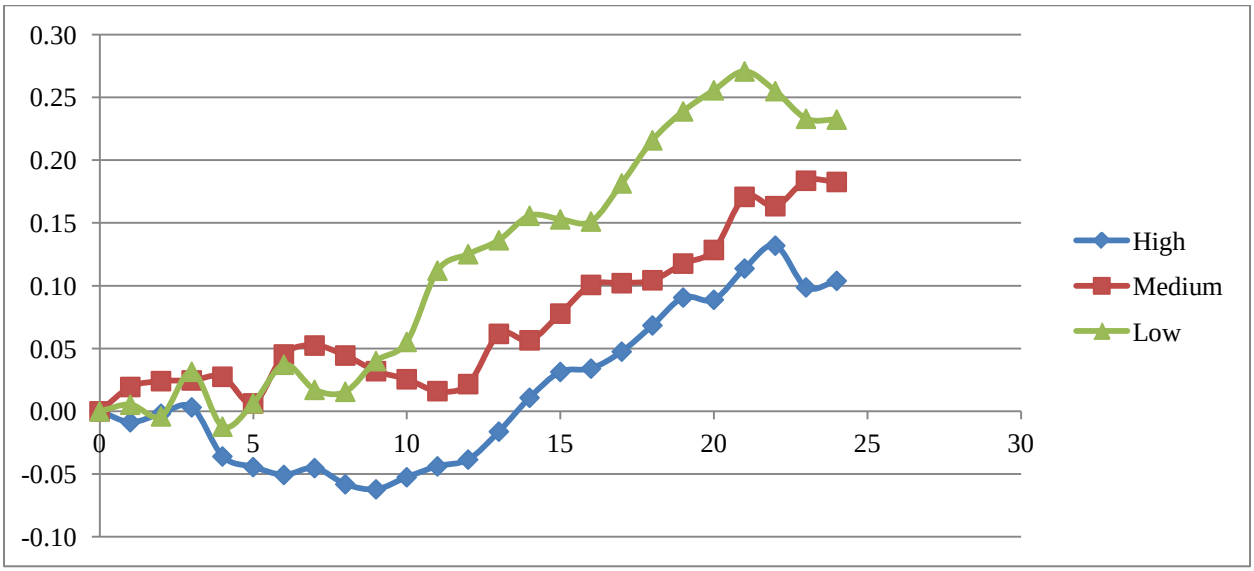
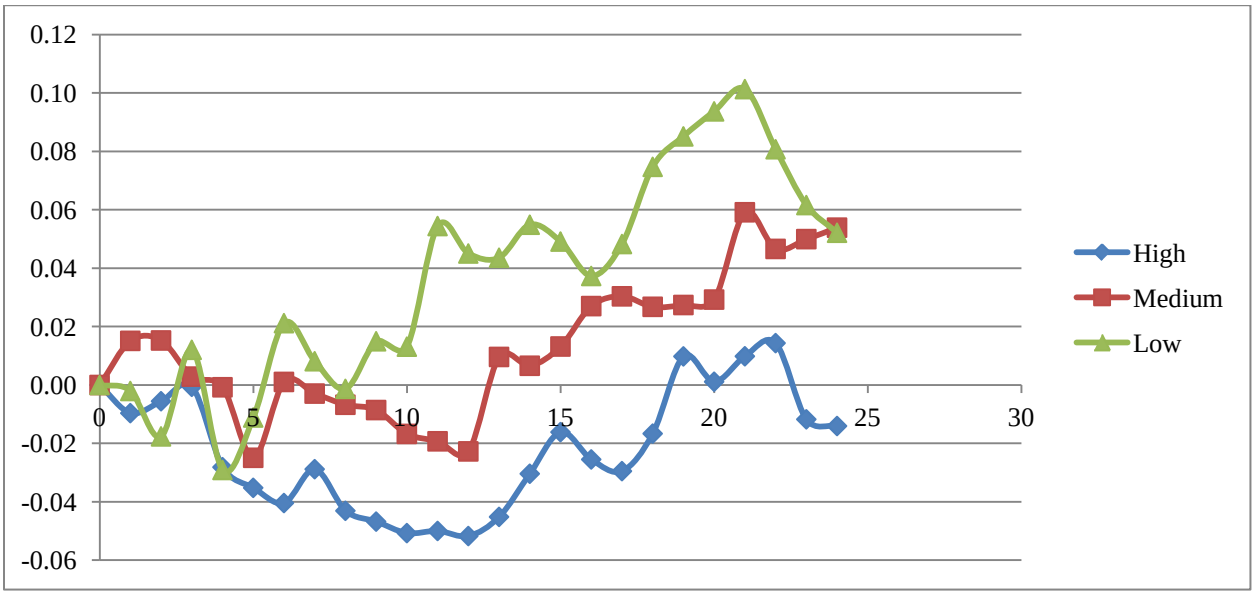


Figure 2 B. Mean size-adjusted Cumulative Abnormal Returns for three portfolios based on the percentage of uncertain growth expectations (*VLG*) in the purchase prices (*PP*)



These figures illustrate the main findings of the study. The portfolios are formed on deal announcement dates based on the percentage of uncertain growth expectations (*VLG*) in the purchase prices (*PP*). High (low) portfolio indicates that acquirers paid relatively more (less) than other acquirers for *VLG*. In both Figures 2 A and 2 B, the mean Cumulative Raw (Abnormal) Returns of high (low) portfolios are lower (higher) than the mean Cumulative Raw (Abnormal) Returns s of other portfolios. If a stock is delisted during the 24-month period after deal announcement, I apply CRSP delisting returns for the first month and assume reinvestment at the risk-free rate.

Table 1: Sample Selection Process

Thomson SDC Platinum mergers and acquisitions Deal announcements made between June 30, 2001 (SFAS 141 effective) and December 31, 2009 Deal value at least $10 million Both acquirer and target are in NYSE, Nasdaq, or AMEX Acquisition of 100% shares of target Non financial acquirer and target	**708**
(-) observations cannot be linked to Compustat, Firstcall (actual announcement date), I/B/E/S (analyst forecasts with two -year forecasting horizons) Remaining observations	(285) 423
(-) observations without purchase price allocation in 10-K filing in SEC EDGAR Remaining observations	(180) 243
(-) observations with negative book value of target, missing control variables Remaining observations	(27) **215**

Table 2: Descriptive Statistics

Panel A: Full Sample

Variables	N	Mean	Median	Std Dev	25th Pctl	75th Pctl
PP(in $ millions)	215	2236.15	591.10	5340.72	191.00	1656.00
GW(in$ millions)	215	1145.25	282.30	2556.84	96.60	977.80
GWI	215	0.27	0.00	0.44	0.00	1.00
BV	215	0.39	0.30	0.37	0.19	0.43
VSE	215	0.14	0.05	0.23	0.00	0.23
VLG	215	0.47	0.57	0.39	0.38	0.68
FVadj	215	0.04	0.09	0.48	-0.09	0.29
GW	215	0.57	0.58	0.30	0.39	0.74
GWother	215	0.10	0.03	0.52	-0.17	0.26
AnnRet(Acquirer)	215	-0.03	-0.02	0.08	-0.07	0.02
Prem4wk	215	48.39	33.45	88.25	21.04	53.85
Size	215	8.01	7.99	1.90	6.85	9.26
Focus	215	0.69	1.00	0.46	0.00	1.00
PctStock	215	41.63	40.27	41.86	0.00	83.20
OV	215	12.72	1.35	21.57	0.00	19.52
RelSize	215	0.40	0.20	0.52	0.08	0.49

This table reports descriptive statistics for M&A deals, purchase price allocations based on GAAP accounting, and components of purchase price based on the new method introduced in the study. *PP* (in $ millions) is purchase price as reported in 10-K. *GW* (in $ millions) is goodwill as reported in 10-K. *GWI* is an indicator variable equal to 1 if goodwill impairment to identified target is reported in any year after the merger or acquisition, 0 otherwise. *BV* is the book value of the target. *VSE* is the value from predictable short-term earnings. *VLG* is the value from long-term growth. *FVadj* is the fair value adjustment of net identifiable assets. *GW* is the portion of the purchase price allocated to goodwill. *GWother* is the difference between the value from long-term growth (*VLG*) and goodwill (*GW*). *AnnRet* is announcement date (three day) returns of acquirers around deal announcements. *Prem4w*k is the amount of premium based on the price at four weeks before deal announcement. *Size* is the log market value of the acquirer. *Focus* is an indicator variable equal to one if the two-digit SIC codes of target and acquirer are the same. *PctSto*ck is the percentage of payment made with stock. *OV* is acquirers' industry-adjusted price-to-earnings ratio. *RelSize* is the relative size of a deal over the market value of an acquirer. *BV*, *VSA*, *VLG*, *FVadj*, *GW*, and *GWother* are scaled by purchase price (*PP*).

Table 2 (continued)

Panel B: Non-impairment Sample (GWI=0)

Variables	N	Mean	Median	Std Dev	25th Pctl	75th Pctl
PP(in $ millions)	157	2198.29	525.20	4845.22	174.90	1780.00
GW(in$ millions)	157	1130.90	243.50	2388.46	88.00	976.90
GWI	157	0.00***	0.00	0.00	0.00	0.00
BV	157	0.40	0.29	0.38	0.19	0.43
VSE	157	0.13	0.01	0.22	0.00	0.18
VLG	157	0.48	0.59	0.40	0.41	0.71
FVadj	157	0.04	0.08	0.50	-0.10	0.31
GW	157	0.56	0.58	0.32	0.34	0.74
GWother	157	0.08	0.02	0.55	-0.20	0.21
AnnRet(Acquirer)	157	-0.03	-0.02	0.08	-0.07	0.02
Prem4wk	157	54.85*	37.96	101.27	22.91	57.48
Size	157	8.35***	8.37	1.80	7.07	9.54
Focus	157	0.68	1.00	0.47	0.00	1.00
PctStock	157	39.37	38.44	41.04	0.00	78.10
OV	157	16.70***	5.97	23.57	0.00	25.90
RelSize	157	0.25***	0.14	0.32	0.07	0.31

Panel C: Impairment Sample (GWI=1)

Variables	N	Mean	Median	Std Dev	25th Pctl	75th Pctl
PP(in $ millions)	58	2338.64	684.50	6543.88	329.70	1465.50
GW(in$ millions)	58	1184.09	414.80	2988.13	148.30	992.70
GWI	58	1.00	1.00	0.00	1.00	1.00
BV	58	0.37	0.31	0.36	0.19	0.42
VSE	58	0.19	0.15	0.23	0.00	0.29
VLG	58	0.44	0.50	0.37	0.32	0.63
FVadj	58	0.05	0.10	0.39	-0.06	0.22
GW	58	0.58	0.59	0.25	0.43	0.72
GWother	58	0.14	0.09	0.41	-0.06	0.31
AnnRet(Acquirer)	58	-0.03	-0.03	0.08	-0.07	0.02
Prem4wk	58	30.89	27.99	27.28	13.44	43.67
Size	58	7.10	7.24	1.88	6.29	7.99
Focus	58	0.72	1.00	0.45	0.00	1.00
PctStock	58	47.75	46.08	43.77	0.00	100.00
OV	58	1.93	0.00	8.01	0.00	0.00
RelSize	58	0.80	0.56	0.72	0.22	1.16

These tables report descriptive statistics for M&A deals, purchase price allocations based on GAAP accounting, and components of purchase price based on the new method introduced in the study for two sub-samples: goodwill non-impairment (Panel B), and goodwill impairment (Panel C). *,**,*** indicate significant in 10%, 5%, and 1% levels, respectively, from t-test between the mean values of the no-impairment and impairment samples.

Table 3: Correlation Matrix

N=217	*GWI*	*BV*	*VSE*	*VLG*	*FVadj*	*GW*	*GWother*	*AnnRet*	*Prem4wk*
GWI	1	-0.03	0.13	-0.04	0.00	0.03	0.05	0.01	-0.12
BV	0.01	1	-0.20	-0.83	-0.77	-0.02	0.62	-0.01	0.20
VSE	0.16	-0.40	1	-0.38	0.05	0.17	0.39	-0.05	-0.05
VLG	-0.12	-0.66	-0.28	1	0.70	-0.08	-0.81	0.04	-0.16
FVadj	-0.01	-0.55	0.16	0.46	1	-0.62	-0.90	0.00	-0.12
GW	0.03	-0.16	0.20	0.06	-0.62	1	0.65	0.01	-0.06
GWother	0.12	0.39	0.28	-0.68	-0.85	0.59	1	-0.02	0.09
AnnRet	-0.03	0.02	-0.09	0.06	0.01	-0.02	-0.06	1	0.04
Prem4wk	-0.19	0.03	-0.18	0.04	0.00	-0.10	-0.05	0.02	1

Table 3 presents the correlation matrix of variables used in the paper. The upper diagonal reports Pearson, the lower diagonal Spearman, correlations. *GWI* is an indicator variable equal to 1 if goodwill impairment to identified target is reported in any year after the merger or acquisition, 0 otherwise. *BV* is the book value of the target. *VSE* is the value from predictable short-term earnings. *VLG* is the value from long-term growth. *FVadj* is the fair value adjustment of net identifiable assets. *GW* is the portion of the purchase price allocated to goodwill. *GWother* is the difference between the value from long-term growth (*VLG*) and goodwill (*GW*). *AnnRet* is announcement date (three day) returns of acquirers around deal announcements. *Prem4wk* is the amount of premium based on the price at four weeks before deal announcement.

Table 4: Long-term Returns of Acquirers after Deal Announcements

	Mean Cumulative Raw Returns				Mean size-adjusted CARs		
	High	Medium	Low		High	Medium	Low
0 m	0.00	0.00	0.00	0 m	0.00	0.00	0.00
1 m	0.00	0.00	0.00	1 m	-0.01	0.02	0.00
2 m	-0.01	0.02	0.01	2 m	-0.01	0.02	-0.02
3 m	0.00	0.02	0.00	3 m	0.00	0.00	0.01
4 m	0.00	0.02	0.03	4 m	-0.03	0.00	-0.03
5 m	-0.04	0.03	-0.01	5 m	-0.04	-0.02	-0.01
6 m	-0.04	0.01	0.01	6 m	-0.04	0.00	0.02
7 m	-0.05	0.05	0.04	7 m	-0.03	0.00	0.01
8 m	-0.05	0.05	0.02	8 m	-0.04	-0.01	0.00
9 m	-0.06	0.04	0.02	9 m	-0.05	-0.01	0.01
10 m	-0.06	0.03	0.04	10 m	-0.05	-0.02	0.01
11 m	-0.05	0.03	0.06	11 m	-0.05	-0.02	0.05
12 m	-0.04	0.02	0.11	12 m	-0.05	-0.02	0.05
13 m	-0.04	0.02	0.13	13 m	-0.05	0.01	0.04
14 m	-0.02	0.06	0.14	14 m	-0.03	0.01	0.05
15 m	0.01	0.06	0.16	15 m	-0.02	0.01	0.05
16 m	0.03	0.08	0.15	16 m	-0.03	0.03	0.04
17 m	0.03	0.10	0.15	17 m	-0.03	0.03	0.05
18 m	0.05	0.10	0.18	18 m	-0.02	0.03	0.07
19 m	0.07	0.10	0.22	19 m	0.01	0.03	0.09
20 m	0.09	0.12	0.24	20 m	0.00	0.03	0.09
21 m	0.09	0.13	0.26	21 m	0.01	0.06	0.10
22 m	0.11	0.17	0.27	22 m	0.01	0.05	0.08
23 m	0.13	0.16	0.26	23 m	-0.01	0.05	0.06
24 m	0.10	0.18	0.23	24 m	-0.01	0.05	0.05

This table reports mean Cumulative Raw Returns and size-adjusted Cumulative Abnormal Returns (CAR s) for 24 months after M&A deal announcement dates (Figure 2 is a graphical illustration of this table). Three portfolios (high, medium, and low) are based on *VLG*, which is the percentage of value of long-term growth over purchase price (*PP*).

Table 5: Long-term Returns from Cross-sectional Regressions and Value from Long-term Growth

Panel A: $year_{t+1}$

Ret_{t+1}	(1)		(2)		(3)		(4)	
Intercept	-0.30*	(-1.85)	-0.29*	(-1.78)	-0.29*	(-1.78)	-0.24	(-1.39)
VLG	-0.21***	(-2.73)	-0.22***	(-2.96)	-0.22***	(-2.91)	-0.23***	(-2.98)
AnnRet					0.10	(0.23)	0.07	(0.16)
Prem4wk					0.00	(0.23)	-0.00	(-0.25)
Beta	-0.00	(-0.05)	-0.00	(-0.06)	-0.00	(-0.04)	0.00	(0.04)
Size	0.05***	(3.43)	0.05***	(3.46)	0.05***	(3.45)	0.04***	(2.97)
BTM	0.00***	(3.45)	0.00***	(3.57)	0.00***	(3.54)	0.00***	(3.06)
MOM			-0.08	(-0.80)	-0.07	(-0.78)	-0.05	(-0.48)
Focus							0.05	(0.88)
PctStock							-0.00	(-1.36)
OVI							0.00	(0.02)
$PctStock \times OVI$							0.00*	(1.73)
RelSize							-0.02	(-0.23)
Adj R^2	0.09		0.1		0.1		0.13	
N	215		215		215		215	

This table reports the estimation results of equation (1) with Ret_{t+1} on the left hand side: Ret_{t+1} is size adjusted cumulative abnormal returns for one year after deal announcement. *VLG* is the value from long-term growth. *AnnRet* is announcement date (three day) returns of acquirers around deal announcements. *Prem4wk* is the amount of premium based on the price at four weeks before deal announcement. *Beta* is estimated from a regression of monthly returns ($R - R_f$) on market returns ($R_m - R_f$) using the 36-month return period. *Size* is the log market value of the acquirer. *BTM* is acquirers' book-to-market ratio before the deal announcement. *MOM* is the size adjusted cumulative abnormal returns for the six month period before the deal announcement. *Focus* is an indicator variable equal to one if the two-digit SIC codes of target and acquirer are the same. *PctStock* is the percentage of payment made with stock. *OVI* is an overvalued share indicator variable which is equal to one if the acquirer's industry-adjusted price-to-earnings ratio is in the first quintile, zero otherwise. *RelSize* is the relative size of a deal over the market value of an acquirer. *,**,*** indicate significant in 10%, 5%, and 1% levels, respectively.

Table 5 (Continued)

Panel B: $year_{t+2}$

Ret_{t+2}	(1)		(2)		(3)		(4)	
Intercept	-0.52***	(-2.64)	-0.51***	(-2.63)	-0.51**	(-2.59)	-0.29	(-1.41)
VLG	-0.21**	(-2.20)	-0.21**	(-2.32)	-0.21**	(-2.30)	-0.20**	(-2.14)
AnnRet					-0.04	(-0.08)	0.13	(0.27)
Prem4wk					-0.00	(-0.46)	-0.00	(-1.40)
Beta	0.05	(0.59)	0.06	(0.65)	0.06	(0.64)	0.07	(0.77)
Size	0.07***	(4.23)	0.07***	(4.33)	0.07***	(4.30)	0.04**	(2.57)
BTM	0.00***	(2.77)	0.00***	(2.98)	0.00***	(2.97)	0.00	(0.86)
MOM			-0.48	(-1.59)	-0.48	(-1.58)	-0.53*	(-1.80)
Focus							0.05	(0.75)
PctStock							0.00	(0.76)
OVI							0.02	(0.17)
PctStock × *OVI*							0.00	(0.94)
RelSize							-0.25***	(-2.66)
Adj R^2	0.09		0.11		0.11		0.18	
N	210		210		210		210	

This table reports the estimation results of equation (1) with Ret_{t+2} on the left hand side: Ret_{t+2} is size adjusted cumulative abnormal returns for two years after deal announcement. *VLG* is the value from long-term growth. *AnnRet* is announcement date (three day) returns of acquirers around deal announcements. *Prem4wk* is the amount of premium based on the price at four weeks before deal announcement. *Beta* is estimated from a regression of monthly returns ($R - R_f$) on market returns ($R_m - R_f$) using the 36-month return period. *Size* is the log market value of the acquirer. *BTM* is acquirers' book-to-market ratio before the deal announcement. *MOM* is the size adjusted cumulative abnormal returns for the six month period before the deal announcement. *Focus* is an indicator variable equal to one if the two-digit SIC codes of target and acquirer are the same. *PctStock* is the percentage of payment made with stock. *OVI* is an overvalued share indicator variable which is equal to one if the acquirer's industry-adjusted price-to-earnings ratio is in the first quintile, zero otherwise. *RelSize* is the relative size of a deal over the market value of an acquirer. *,**,*** indicate significant in 10%, 5%, and 1% levels, respectively.

Table 6: Short-term Market Reactions and Value from Long-term Growth

AnnRet	(1)		(2)	
Intercept	0.02	(1.33)	0.02	(1.27)
VLG	-0.00	(-0.04)	-0.00	(-0.03)
Prem4wk			0.00	(0.20)
Focus	-0.03**	(-2.21)	-0.03**	(-2.20)
PctStock	-0.00***	(-3.75)	-0.00***	(-3.74)
OVI	-0.00	(-0.22)	-0.00	(-0.25)
$PctStock \times OVI$	-0.00	(-0.53)	-0.00	(-0.51)
RelSize	-0.00	(-0.21)	-0.00	(-0.20)
$Adj\ R^2$	0.14		0.14	
N	215		215	

This table represents the estimation result of equation (2): *AnnRet* is the announcement date (three day) returns of acquirers around deal announcements. *VLG* is the value from long-term growth. *Prem4wk* is the amount of premium based on the price at four weeks before deal announcement. *Focus* is an indicator variable equal to one if the two-digit SIC codes of target and acquirer are the same. *PctStock* is the percentage of payment made with stock. *OVI* is an overvalued share indicator variable which is equal to one if the acquirer's industry-adjusted price-to-earnings ratio is in the first quintile, zero otherwise. *RelSize* is the relative size of a deal over the market value of an acquirer. *,**,*** indicate significant in 10%, 5%, and 1% levels, respectively.

Table 7: Goodwill Impairments and Value from Long-term Growth

GWI	(1)		(2)		(3)		(4)		(5)		(6)	
Intercept	0.76	(0.16)	0.96	(0.24)	0.95	(0.24)	1.09	(0.30)	0.95	(0.24)	1.09	(0.30)
GW	1.34	(2.02)	1.29	(1.84)					1.25	(1.79)	1.22	(1.65)
GWother					1.25	(1.79)	1.22	(1.65)				
VLG					2.35**	(4.20)	2.28**	(3.88)	1.10*	(2.71)	1.07	(2.52)
AnnRet			-0.58	(0.04)			-0.25	(0.01)			-0.25	(0.01)
Prem4wk			0.00	(0.40)			0.00	(0.21)			0.00	(0.21)
Size	-0.42***	(8.84)	-0.42***	(8.84)	-0.51***	(10.77)	-0.51***	(10.67)	-0.51***	(10.77)	-0.51***	(10.67)
Focus	0.18	(0.10)	0.21	(0.13)	0.36	(0.40)	0.38	(0.43)	0.36	(0.40)	0.38	(0.43)
PctStock	0.00	(0.55)	0.00	(0.44)	0.00	(0.55)	0.00	(0.47)	0.00	(0.55)	0.00	(0.47)
OVI	-2.80	(2.81)	-2.70	(2.57)	-2.79*	(2.66)	-2.73	(2.53)	-2.79*	(2.66)	-2.73	(2.53)
PctStock ×*OVI*	-0.01	(0.05)	-0.01	(0.06)	-0.01	(0.10)	-0.02	(0.11)	-0.01	(0.10)	-0.02	(0.11)
Year	yes		yes		yes		yes		yes		yes	
targetSIC	yes		yes		yes		yes		yes		yes	
Pseudo R^2	0.40		0.40		0.41		0.41		0.41		0.41	
N	215		215		215		215		215		215	

Table 7 reports the estimation results of equation (3): *GWI* is an indicator variable equal to 1 if goodwill impairment to identified target is reported in any year after the merger or acquisition, 0 otherwise. *GW* is the portion of the purchase price allocated to goodwill. *GWother* is the difference between the value from long-term growth (*VLG*) and goodwill (*GW*). *VLG* is the value from long-term growth. *AnnRet* is announcement date (three day) returns of acquirers around deal announcements. *Prem4wk* is the amount of premium based on the price at four weeks before deal announcement. *Size* is the log market value of the acquirer. *Focus* is an indicator variable equal to one if the two-digit SIC codes of target and acquirer are the same. *PctStock* is the percentage of payment made with stock. *OVI* is an overvalued share indicator variable which is equal to one if the acquirer's industry-adjusted price-to-earnings ratio is in the first quintile, zero otherwise. *,**,*** indicate significant in 10%, 5%, and 1% levels, respectively.

Table 8: Goodwill and Value from Long-term Returns in Predicting Long-term Returns

	Ret_{t+1}						Ret_{t+2}					
	(1)		(2)		(3)		(4)		(5)		(6)	
Intercept	-0.26	(-1.46)	-0.21	(-1.13)	-0.21	(-1.13)	-0.43**	(-2.17)	-0.38*	(-1.89)	-0.38*	(-1.89)
GW	-0.01	(-0.05)			-0.04	(-0.45)	0.13	(1.16)			0.10	(0.88)
GWother			-0.04	(-0.45)					0.10	(0.88)		
VLG			-0.28**	(-1.97)	-0.24***	(-2.92)			-0.08	(-0.46)	-0.18*	(-1.92)
AnnRet	0.10	(0.21)	0.07	(0.16)	0.07	(0.16)	0.12	(0.23)	0.15	(0.30)	0.15	(0.30)
Prem4wk	0.00	(0.44)	-0.00	(-0.30)	-0.00	(-0.30)	-0.00	(-0.67)	-0.00	(-1.08)	-0.00	(-1.08)
Beta	0.02	(0.33)	0.00	(0.02)	0.00	(0.02)	0.06	(0.97)	0.05	(0.87)	0.05	(0.87)
Size	0.03*	(1.97)	0.04***	(2.97)	0.04***	(2.97)	0.04**	(2.34)	0.05***	(3.06)	0.05***	(3.06)
BTM	0.00***	(2.84)	0.00***	(3.07)	0.00***	(3.07)	0.00	(0.04)	0.00	(0.11)	0.00	(0.11)
MOM	0.00	(0.00)	-0.05	(-0.53)	-0.05	(-0.53)	-0.42	(-1.41)	-0.44	(-1.44)	-0.44	(-1.44)
Focus	0.06	(1.07)	0.04	(0.80)	0.04	(0.80)	0.07	(1.00)	0.06	(0.83)	0.06	(0.83)
PctStock	-0.00	(-1.21)	-0.00	(-1.35)	-0.00	(-1.35)	0.00	(0.77)	0.00	(0.61)	0.00	(0.61)
OVI	0.00	(0.05)	0.00	(0.07)	0.00	(0.07)	0.04	(0.43)	0.04	(0.37)	0.04	(0.37)
PctStock ×OVI	0.00	(1.43)	0.00*	(1.73)	0.00*	(1.73)	0.00	(0.55)	0.00	(0.83)	0.00	(0.83)
RelSize	-0.03	(-0.38)	-0.02	(-0.21)	-0.02	(-0.21)	-0.26***	(-2.88)	-0.25***	(-2.69)	-0.25***	(-2.69)
Adj R^2	0.08		0.13		0.13		0.17		0.19		0.19	
N	215		215		215		210		210		210	

This table reports the estimation results for equation (4): Ret_{t+i} is size adjusted cumulative abnormal returns for one or two years after deal announcements. *VLG* is the value from long-term growth. *GW* is the portion of the purchase price allocated to goodwill. *GWother* is the difference between the value from long-term growth (*VLG*) and goodwill (*GW*). *VLG* is the value from long-term growth. *AnnRet* is announcement date (three day) returns of acquirers around deal announcements. *Prem4wk* is the amount of premium based on the price at four weeks before deal announcement. Control variables are as defined in Appendix A. *,**,*** indicate significant in 10%, 5%, and 1% levels, respectively.

Table 9: Future Returns from Cross-sectional Regression for Firms with Negative Value from Short-term Earnings

	Ret_{t+1}				Ret_{t+2}			
	(1)		(2)		(3)		(4)	
Intercept	-0.22	(-1.23)	-0.19	(-1.03)	-0.46*	(-1.76)	-0.04	(-0.19)
VLG	-0.25**	(-2.20)	-0.23**	(-2.26)	-0.02	(-0.09)	-0.02	(-0.13)
NegVSE	0.15	(1.22)	0.17	(1.44)	0.40***	(2.61)	0.28**	(2.20)
VLG×NegVSE	-0.07	(-0.39)	-0.12	(-0.67)	-0.49**	(-1.99)	-0.42**	(-2.02)
AnnRet			-0.27	(-0.52)			-0.76	(-1.40)
Prem4wk			0.00	(0.84)			0.00	(0.13)
Beta	-0.03	(-0.50)	-0.02	(-0.42)	0.04	(0.37)	0.02	(0.16)
Size	0.05***	(2.79)	0.04**	(2.44)	0.06***	(3.30)	0.02	(1.23)
BTM	0.00***	(3.04)	0.00***	(2.92)	0.00	(1.35)	-0.00	(-0.16)
MOM	-0.02	(-0.16)	0.01	(0.09)	-0.47	(-1.32)	-0.60*	(-1.84)
Focus			-0.00*	(-1.78)			0.00	(0.96)
PctStock			0.01	(0.19)			0.02	(0.22)
OVI			0.01	(0.16)			0.09	(0.81)
PctStock×OVI			0.00	(1.59)			-0.00	(-0.08)
RelSize			0.02	(0.29)			-0.32***	(-3.05)
Adj R^2	0.10		0.13		0.14		0.23	
N	215		215		210		210	

This table reports the estimation results for equation (5): Ret_{t+i} is size adjusted cumulative abnormal returns for one or two years after deal announcement. *VLG* is the value from long-term growth. *NegVSE* is an indicator variable equal to 1 if *VSE* is smaller than 0, 0 otherwise. *AnnRet* is announcement date (three day) returns of acquirers around deal announcements. *Prem4wk* is the amount of premium based on the price at four weeks before deal announcement. . *Beta* is estimated from a regression of monthly returns ($R - R_f$) on market returns ($R_m - R_f$) using the 36-month return period. *Size* is the log market value of the acquirer. *BTM* is acquirers' book-to-market ratio before the deal announcement. *MOM* is the size adjusted cumulative abnormal returns for the six month period before the deal announcement *Focus* is an indicator variable equal to one if the two-digit SIC codes of target and acquirer are the same. *PctStock* is the percentage of payment made with stock. *OVI* is an overvalued share indicator variable which is equal to one if the acquirer's industry-adjusted price-to-earnings ratio is in the first quintile, zero otherwise. *RelSize* is the relative size of a deal over the market value of an acquirer. *,**,*** indicate significant in 10%, 5%, and 1% levels, respectively.

Table 10: Value of Targets and Its Components in Predicting Long-term Returns

	Ret_{t+1}				Ret_{t+2}			
	(1)		(2)		(3)		(4)	
Intercept	-0.47***	(-2.79)	-0.50***	(-2.96)	-0.51***	(-2.65)	-0.55***	(-2.95)
TgtVal	0.23***	(2.98)			0.19**	(2.13)		
BV			0.27***	(2.69)			0.25**	(2.45)
VSE			0.13	(1.41)			0.05	(0.34)
AnnRet	0.07	(0.16)	0.03	(0.06)	0.16	(0.32)	0.10	(0.20)
Prem4wk	-0.00	(-0.25)	-0.00	(-0.40)	-0.00	(-1.25)	-0.00	(-1.43)
Beta	0.00	(0.04)	0.00	(0.00)	0.05	(0.86)	0.05	(0.82)
Size	0.04***	(2.97)	0.05***	(3.28)	0.05***	(3.03)	0.06***	(3.48)
BTM	0.00***	(3.06)	0.00***	(2.92)	0.00	(0.19)	-0.00	(-0.00)
MOM	-0.05	(-0.48)	-0.05	(-0.47)	-0.48	(-1.61)	-0.47	(-1.54)
Focus	0.05	(0.88)	0.05	(0.87)	0.05	(0.68)	0.04	(0.66)
PctStock	-0.00	(-1.36)	-0.00	(-1.47)	0.00	(0.64)	0.00	(0.48)
OVI	0.00	(0.02)	0.00	(0.02)	0.04	(0.41)	0.04	(0.40)
$PctStock \times OVI$	0.00*	(1.73)	0.00*	(1.69)	0.00	(0.86)	0.00	(0.78)
RelSize	-0.02	(-0.23)	-0.00	(-0.01)	-0.25***	(-2.65)	-0.23**	(-2.53)
Adj R^2	0.13		0.13		0.18		0.19	
N	215		215		210		210	

This table reports the estimation results for equation (6): Ret_{t+i} is size adjusted cumulative abnormal returns for one or two years after deal announcement. *TgtVal* is the value of a target (*TgtVal=BV+VSE*). *BV* is book value of a target. *VSE* is the value from short-term earnings. *AnnRet* is announcement date (three day) returns of acquirers around deal announcements. *Prem4wk* is the amount of premium based on the price at four weeks before deal announcement. . *Beta* is estimated from a regression of monthly returns ($R - R_f$) on market returns ($R_m - R_f$) using the 36-month return period. *Size* is the log market value of the acquirer. *BTM* is acquirers' book-to-market ratio before the deal announcement. *MOM* is the size adjusted cumulative abnormal returns for the six month period before the deal announcement *Focus* is an indicator variable equal to one if the two-digit SIC codes of target and acquirer are the same. *PctStock* is the percentage of payment made with stock. *OVI* is an overvalued share indicator variable which is equal to one if the acquirer's industry-adjusted price-to-earnings ratio is in the first quintile, zero otherwise. *RelSize* is the relative size of a deal over the market value of an acquirer. *,**,*** indicate significant in 10%, 5%, and 1% levels, respectively.